POSITRON EMISSION FROM SUBCRITICAL SYSTEMS*

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INTRODUCTION

This contribution is a continuation of the talk presented by C. Kozhuharov during this conference \textsuperscript{1}, thus a detailed introduction is omitted.

The data presented in this contribution differ in so far from the data shown during the conference and presented partially in the summary talk by P. Kienle \textsuperscript{2} as most of the preliminary results are now completely analyzed, i.e. the efficiency of the apparatus was taken into account and absolute positron-emission probabilities are given.

The structures observed in positron spectra obtained for overcritical heavy-ion collisions are far from being understood. In order to reduce the number of speculations and models to explain these structures and to get additional hints with respect to the possible origin of the observed positron lines several subcritical heavy-ion systems were investigated by the ORANGE-collaboration.

EXPERIMENTAL SET-UP

The spectral distribution of positrons, emitted during a heavy ion
Fig. 1: Experimental set-up, consisting of an ORANGE-spectrometer combined with a multi-detector system ('PAGODA') for the positron detection and a θ- and φ-sensitive parallel plate avalanche counter used for the heavy ion detection. The ORANGE-spectrometer consists of 60 coils arranged cylindrically around the beam axis. The 'PAGODA' consists of 10 planes ('roofs') each containing 6 cooled high resolution Si-detectors.

collision, were obtained with the experimental set-up shown in Fig. 1. The main component is an iron-free 'orange-type' spectrometer consisting of 60 coils arranged radially around the beam axis. Compared to the set-up discussed by C. Kozhuharov 1, several improvements were made in order to obtain a higher energy resolution, a better signal to noise ratio and a significantly higher efficiency:

**Positron Detector**

Positrons emerging from the target area are focussed in backward direction onto a so-called PAGODA detector. It consists of 10 'pagoda roofs' mounted along the beam axis. Each roof is of hexagonal shape and contains 6 high resolution Si-detectors. The Si-detectors are cooled by alcohol down to -30 °C. A matrix readout (rows and columns) is used to get the information about energy and arrival time of particles separately for each detector. The energy